



IAEA

International Atomic Energy Agency
Atoms for Peace and Development

Information Exchange Platforms

ORPNET

UMEX

NORMEX

H. Burçin Okyar

Occupational Radiation Protection Unit

Radiation Safety & Monitoring Section, NSRW



NORM IX

Ninth International Symposium
Naturally Occurring Radioactive Material

IAEA Workshop on the Safe Management
of NORM
25 September 2019

Occupational Radiation Protection NETWORKS

News

2018 Edition of the IAEA Safety Glossary has been published



The ORPNET is pleased to announce that the 2018 Edition of the IAEA Safety Glossary has been published online.

The 2018 Edition of the Safety Glossary takes into account new terminology and usage in all safety standards issued since 2007. Please use the IAEA Safety Glossary in your work and note that **worker** is defined as "any person who works, whether full time, part time or temporarily, for an employer and who has recognized rights and duties in relation to occupational radiation protection. A self-employed person is regarded as having the duties of both an employer and a worker".

NORM IX Symposium - Registration is now open



CRCPD is pleased to announce that registration for NORM IX Symposium is now open. Learn how NORM is managed around the world and discuss safety and environmental impacts from NORM, as well as best practices for NORM Management. The Symposium will include presentations, posters, training and round table sessions from industry representatives, scientists, regulators and other stakeholders.

NORM IX will be hosted for the first time in the United States, in beautiful downtown Denver, Colorado, 23-27 September 2019. View the flyer and agenda attached to learn more, or visit www.CRCPD.org/NORMIX to register for this exciting event.

Safety Culture in Focus at a Regional Meeting hosted by Chile

Resources

- How can workers be protected from natural radiation? (VIDEO)
- How can workers be protected from natural radiation? (PHOTO ESSAY)
- The Information System on Occupational Exposure in Medicine, Industry and Research (ISEMIR)
- Occupational Radiation Protection Appraisal Service (ORPAS)
- Publications
- Posters
- ORP Webinars
- Personal Online Dosimetry Using computational Methods (PODIUM)



Register for
ORPNET Newsletter

Events & Meetings



Registration is now open

ORPNET

Occupational Radiation Protection Networks

First link, if you goggle
"IAEA ORPNET"

<https://nucleus.iaea.org/sites/orpnet/home/SitePages/Home.aspx>

ORPNET



- Web-based network with an ultimate goal to **promote optimization of the occupational radiation protection.**
- It acts as a **focal point** for the occupational radiation protection providing:
 - Worldwide comprehensive knowledge / information exchange,
 - Global, regional and national networks (targeted to systems for radiation protection of workers).
- The user can find also information about
 - the upcoming occupational radiation protection related meetings,
 - latest publications,
 - joint projects,
 - posters, and news.
- ORPNET spreads good practices, facilitates ALARA implementation, supports experience exchange, and aims to prevent any overlap of activities at the national and international level.

World-wide networks

- International System on Occupational Exposures (ISOE)
- International System on Occupational Exposure in Medicine, Industry and Research (ISEMIR)
- Information System on Uranium Mining Exposures (UMEX)

Regional networks

- RECAN (The Regional European and Central Asian ALARA Network)
- ARAN (Asian ALARA Network)
- REPROLAM (Red de Optimización de Protección Radiológica Ocupacional en Latino América)
- EAN (European ALARA Network)
- EAN NORM (The European ALARA Network for Naturally Occurring Radioactive Materials)
- EMAN (European Medical ALARA Network)
- French regional Radiation Protection Officer's networks (CoRPAR)
- ESOREX (European Study on Occupational Radiation Exposure)

ORPNET e-Newsletter



ORPNET – web-based networks – are promoting optimization of occupational radiation protection. The newsletter brings you news from the world of radiation protection of workers and about worldwide, regional and national networks and systems in this area.

Read more

Watch Video

News – June 2019



The Role of Industry in NORM Policy and Decision Making – a Practical Perspective

Free online lecture with invited speakers from Australasian Radiation Protection Society (ARPS) and United States Environmental Protection Agency (EPA).

https://mailchi.mp/8dc89d5e14d3/orpnet

IAEA Nuclear Safety and Security

ORPNET newsletter

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Information System on Uranium Mining Exposures (UMEX)

An IAEA Survey of Global Uranium Mining and Processing Occupational Doses

BROWSE PAGE PUBLISH FOLLOW

ORPNET What is ORPNET? **Worldwide Networks** Regional Networks Additional Resources Training

Search this site

Information System on Uranium Mining Exposures (UMEX)

The Information System on Occupational Exposure in Medicine, Industry and Research (ISEMIR)

- ISEMIR application
- ISEMIR - Industrial Radiography FAQ
- ISEMIR-IR User Guide
- ISEMIR-IR User Guide Russian
- ISEMIR Brochure
- Learn more about WGIR
- Learn more about WGIC
- IAEA TECDOC 1747
- Introduction to ISEMIR-IR
- Road Map Tool

Background

During uranium mining and processing, workers may be internally exposed from inhalation of radon progeny, inhalation of aerosols containing long lived alpha activity, and exposed externally to gamma rays emitted from the ores, process materials, products and tailings. World annual uranium production in 2015 was nearly 55 975 tU (Uranium 2016: Resources, Production and Demand - A Joint Report by the Nuclear Energy Agency and the International Atomic Energy Agency). With the current interest in nuclear power, there has been an increase in uranium exploration and also in the development of new uranium mining and processing facilities in many countries. As a consequence, the numbers of workers in uranium mining and processing may increase substantially within a few years. With this in mind, the International Atomic Energy Agency (IAEA) has proposed the development of an information exchange system for occupational exposure in the uranium mining and processing industry with the view to strengthen occupational radiation protection arrangements for workers, to share dose reduction information, operational experience and information to improve the optimization of worker doses, and to support quality assurance programs across the industry. The information will also support the development of safety standards for uranium industry.

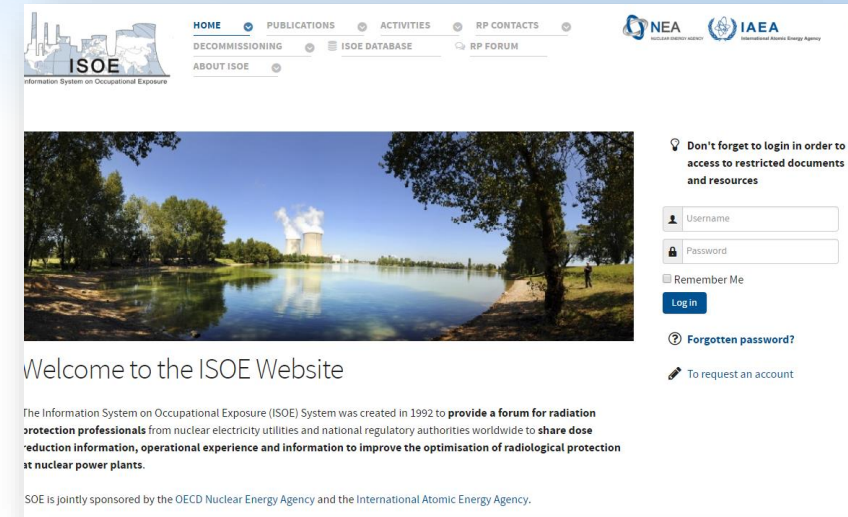
Objective

- To enhance radiation protection of workers in uranium mining and processing.

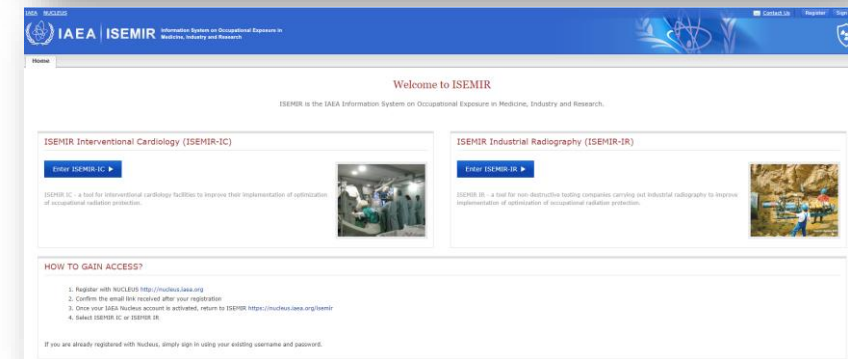
<https://nucleus.iaea.org/sites/orpnet/worldwide/umex/SitePages/Home.aspx>

UMEX – The Idea

- For nuclear industry workers there are a number of databases of occupational doses at both international and national level (Information System on Occupational Exposure, **ISOE**)
- Similar systems have been developed for medical exposures and industrial workers (**ISEMIR**)
- The Information System for Uranium Mining Exposures (**UMEX**) was designed to examine global occupational exposures in uranium mining and processing



The screenshot shows the ISOE website interface. At the top, there is a navigation menu with links for HOME, PUBLICATIONS, ACTIVITIES, RP CONTACTS, DECOMMISSIONING, ISOE DATABASE, and RP FORUM. Below the navigation is a large banner image of a nuclear power plant. To the right of the banner is a login form with fields for Username and Password, a Remember Me checkbox, a Log In button, and links for Forgotten password? and To request an account. Below the banner, the text reads: "Welcome to the ISOE Website" and "The Information System on Occupational Exposure (ISOE) System was created in 1992 to provide a forum for radiation protection professionals from nuclear electricity utilities and national regulatory authorities worldwide to share dose reduction information, operational experience and information to improve the optimisation of radiological protection at nuclear power plants." At the bottom, it states: "SOE is jointly sponsored by the OECD Nuclear Energy Agency and the International Atomic Energy Agency."



The screenshot shows the ISEMIR website interface. At the top, there is a navigation menu with links for HOME, IAEA, ISEMIR, and Information System on Occupational Exposure in Medicine, Industry and Research. Below the navigation is a large banner image of a nuclear power plant. To the right of the banner is a login form with fields for Username and Password, a Remember Me checkbox, a Log In button, and links for Forgotten password? and To request an account. Below the banner, the text reads: "Welcome to ISEMIR" and "ISEMIR is the IAEA Information System on Occupational Exposure in Medicine, Industry and Research." Below this, there are two main sections: "ISEMIR Interventional Cardiology (ISEMIR-IC)" and "ISEMIR Industrial Radiography (ISEMIR-IR)". Each section has a brief description and a "Enter ISEMIR-IC" or "Enter ISEMIR-IR" button. At the bottom, there is a "HOW TO GAIN ACCESS?" section with a list of steps: 1. Register with NUCHEX (http://nuhex.iaea.org), 2. Confirm the email ID received after your registration, 3. Once your IAEA NuHex account is activated, return to ISEMIR (https://nuhex.iaea.org/isemir), 4. Select ISEMIR-IC or ISEMIR-IR. Below this, it states: "If you are already registered with NuHex, simply sign in using your existing username and password."

UMEX – The Design Requirements



- Important requirements and information to collect:
 - **Capture as many of the uranium workers** as possible across a wide number of jurisdictions
 - Need to know the **type of operation** and **nature of the work** being performed
 - Need to understand the **key assumptions used to monitor and calculate exposure and dose**
 - **Collect dose information** based on individual pathways
 - Ideally wish to know the **underlying dose distribution**
 - **Record primary control mechanisms to optimise dose**

UMEX – The Design, Limitations & Solutions



- **PRIVACY** – A critical limitation so only amalgamated information received to prevent with no personal identifiers
- **EASE of USE** – To enable the widest possible response needed to make the data entry easy and quick (*otherwise it would not happen*)
- **Multiple Dose Databases** – Used national regulator to determine which is and use the official dose register
- **Variability** – Combination of drop down menus, information tabs and free form fields to structure data entry
- **Different Dose Methodologies** – Capture as much information about monitoring and dose calculation methodologies

UMEX – The Response



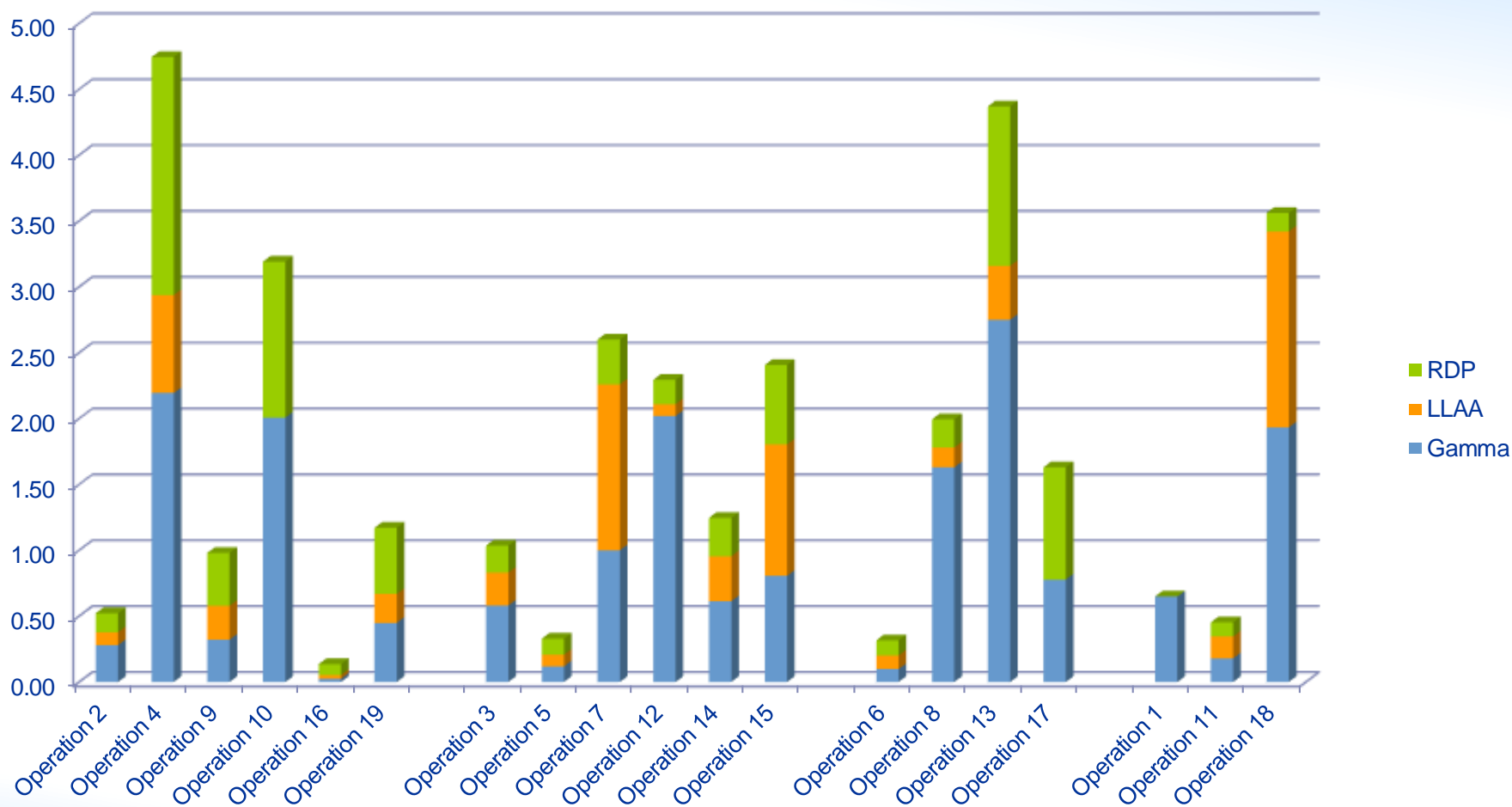
- The survey provided a snapshot of the doses in the **2012** calendar year
- Occupational data from **36 operating facilities** were received
- This covered production of 58,344t of uranium or approximately **85% of global uranium production**
- Amalgamated dose data was received from **in excess of 30,000 workers**

UMEX – The Results



- They characterise a industry where **occupational exposures** are well controlled and doses remain within applicable limits
- Average doses were typically **less 5mSv/y** and the maximum **individual dose was 16.5mSv/y**
- Majority of doses to personnel were below 2mSv/y

Breakdown of Average Doses by Pathway & Operation



Example of UMEX USE: Different Dose Distributions

- **Distributions of doses heavily influenced by the choice of workgroup and who is included**
- This distribution variability raises questions about the use of normal statistical methods for interpreting doses
- Also may call into question the use of average dose and how workgroups are defined

- The original UMEX provided a 2012 snapshot of occupational doses in the uranium industry
- The response covered approximately 85% of global uranium production
- The doses show compliance with international recommendations and represent good practice globally
- The findings of the project are incorporated in the IAEA Safety Report (SR-100)

Web-based Information Exchange Platform on ORP in Industries involving NORM (NORMEX)



- **Proposal** - to develop an overview tool (or a database) through a Working Group to better share RP operational management experience among various industries involving NORM
- The quantities of NORM, and hence the resulting exposures to workers, differ widely from field to field.
- Lack of real data (as opposed to theoretical assessment) regarding actual exposure of workers in NORM activities – especially regarding internal exposure
- ORP data is the key for decision making (data from literature or with a survey)
- Measurement of activity concentrations of NORM in any field, and generic modelling of the behaviour of workers, will allow average exposures to be assessed.
- Following this approach, a possible mode for the control of exposures in industries is that the regulatory body, after consultation with the industry, establishes (regulatory guidance document) a level of dose and a methodology for dose assessment.
 - A methodology for acquiring and validating relevant ORP data and regulatory modalities
 - A methodology for analysis and effective dissemination of relevant ORP data (realistic radiological impact assessment)
 - Establishment of a web-based information exchange platform
 - An IAEA report addressing approaches



IAEA

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Thank you!

IAEA ORNET: <https://nucleus.iaea.org/sites/orpnet/home/SitePages/Home.aspx>

IAEA UMEX: <https://nucleus.iaea.org/sites/orpnet/worldwide/umex/SitePages/Home.aspx>